# CHAPTER I.—DESCRIPTIVE.

## Section A.—Physical Aspects.

Boundaries and dimensions.

THE present Karnal district has an area of 3,128 square miles. The river Jumna forms its eastern boundary, and across that river the district is faced by the districts of Saharanpur, Muzaffarnagar and Meerut in the United Provinces. To the north lie the Jagadhri and Ambala tahsils of the Ambala district, while the north-west and western boundaries are formed by the Patiala and Jind States. On the south are the Gohana tahsil of the Rohtak district and the Sonepat tahsil of the Delhi district.

The extreme breadth of the district is 44 miles and the extreme length 64 miles.

Physical features.

The district comprises four tahsils, Panipat, Karnal, Thanesar and Kaithal. It is traversed from north to south by the watershed between the Indian Ocean and the Bay of Bengal. To the east of the watershed is the Khadir or riverain tract of the Jumna, west of the watershed lies the Bangar, an upland plain stretching parallel to the Khadir throughout its entire length. These two divisions are common to the three eastern tahsils, Panipat. Karnal and Thanesar. In Karnal and Kaithal, however, to the west of the Bangar, stretches a high and once arid country known as the Nardak, to the west of which again lies the Bangar tract of the Kaithal tahsil, resembling the uplands of Rohtak and Hansi. The Bangar tracts, except in Thanesar, and the whole of the Nardak are now fully irrigated by the Western Jumna Canal. In the north of the district, in the Thanesar tahsil and the Guhla sub-tahsil of Kaithal, the country to the west of the Bangar is traversed by a series of hill torrents, of which the most important are the Markanda, Umla, Sarusti, Chautang and Rakshi. On the action of these streams the prosperity of this northern tract depends. Their influence is shown in the great diversity of soils they have formed, from the fertile loam of the Markanda Bet to the stiff clay of the Chachra and Naili covered with dense thickets of *dhak* (butea frondosa). The Ghaggar may be said to form the northern boundary of the district, but beyond it are a few outlying estates scattered in Patiala territory belonging to the Jagirdars of Arnauli and Sidhowal and included in British territory for political reasons. They lie in an extensive plain intersected by sand hills, but with many rich loamy hollows in which well cultivation is easy and profitable.

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Physical features.

The district is everywhere well wooded. The fertile fields of the Khadir and Bangar are studded with groves of mangoes and *jamoa*, while in the Nardak, Chachra and Naili the masses of *dhak* trees form the feature of the landscape varied by the *pipal*, *bhor*, and *pilkhan*. The palm tree is plentiful in the Khadir, and the *kikar* is often found, but the *shisham* is comparatively rare except where planted on canal banks or by the roadside. A number of trees not indigenous to the district are found on the old Imperial canal. Grasses are plentiful in the Bangar and Nardak, the best for grazing being *dubra*, *anjan* and *palwa*. *Panni* is useful for thatching. The Khadir produces most inferior grazing, except near the Jumna where the grass is protected by the fringe of *jhao* brushwood adjoining the river bed.

The Jumna and flood channels.

In the months of July, August and September when the river is in flood and good rainfall has reduced the demand for canal water, the Jumna is a formidable river. Its waters often cause considerable damage to villages on its banks, and penetrating inland through the numerous flood channels intersecting the Khadir are anything but beneficial to the *kharif* crop. The silt of the Jumna is not so valuable as the silt of the Punjab rivers. The deposit contains too much sand. At the same time the villages whose *kharif* crops are damaged are undoubtedly gainers in the *rabi*. Of the flood channels which traverse the Khadir tract the most important are the Nun in the northern Indri Khadir, the Puran or old Jumna near Kunjpura, and the Dolaha which flows through *Barsat* and occasionally brings floods as far inland as Panipat city. At present the set of the river in the Karnal tahsil is towards the districts of the United Provinces, and a considerable area was added to the Karnal district in 1908. In the Panipat and Thanesar tahsils, however, the set is towards the Punjab or right bank, and some of the best land in the district, including many valuable wells, has been carried away during the last few years.

Canal escapes.

Whenever there is a slackening in the demand for water in the districts served by the Western Jumna Canal the canal authorities dispose of the surplus supply collected in the upper reaches of the canal through large escapes which conduct the water back into the Jumna and form somewhat important features in the agriculture of the Khadir. These escape channels after a short artificial course tail off into some natural depression leading to the river. The Kunjnu and Dhanaura escapes, which take out of the canal above

Canals escapes.

Indri, have a short course and have little effect on the country through which they pass. But the Indri escape or Budha Khera Nala and the Rer escape or Khojgipur Nala are more important. The former takes the surplus water from the Indri lock down through the channel of the old Western Jumna Canal to Budha Khera a few miles north-east of Karnal and thence by an old channel into the Jumna. The body of water thus disposed of is considerable and the moisture benefits a few villages near Indri. The junction of this channel with the main stream of the Jumna at Kairwali gives rise to heavy floods in some riverain villages in the vicinity. The effect is not always beneficial and the large village of Barsat has been particularly unfortunate. The deep catch water drain, known as the Rer or Munak escape, and to the *zamindars* as the Khojgipur or Ganda Nala, carries surplus water from the Munak regulator and drains the south of the Karnal tahsil. It has been much improved since settlement. The banks have been strengthened and the channel bridged in several places. From Babail its course has been changed, thus removing a source of danger to some prosperous riverain villages of the northern Khadir. Instead of holding up the floods as at settlement it conveys them along with the surplus canal water through an old winding arm of the river to join the Jumna at Khojgipur, some 12 miles south of its former outfall.

The Western Jumna Canal.

The old canal at the time of Mr. Ibbetson's Karnal Settlement still ran from Indri downwards in the old channel which was practically identical with the Badshahi Canal constructed by the Moghals. It wound its course through the Khadir, and did not enter the Bangar till it reached the old Imperial bridge on the Grand Trunk Road four miles south of Karnal. The evils which resulted from faulty alignments, disregard of the natural drainage, and excessive irrigation are described at length in Mr. Ibbetson's Karnal Settlement Report (paragraphs 159-169).

Fortunately the state of affairs described by Mr. Ibbetson had not long to wait for a remedy. The re-alignment of the main line from Indri to Munak and of the distributaries was actually being carried out when Mr. Ibbetson wrote, and in August 1885 the old canal between Indri and Rer was finally closed and relegated to its proper position as a drainage line.

From Tajewala in the Ambala district, where the Western Jumna Canal takes out of the Jumna, as far as Indri

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the alignment of the old Badshahi Canal is followed with but few modifications. This reach is really an arm of the Jumna pressed into service by the original constructors of the canal, and has now to carry the whole supply of the modern system. Two-thirds of as much of the Jumna River water as is available for irrigation is taken as far as Indri in one united stream, the volume of which since the opening of the Sirsa Branch greatly exceeds that carried at last settlement. In this reach considerable damage has been caused by percolation owing to the water held up at the Indri regulator to supply the Sirsa Branch which leaves the Main Canal at this point.

Below Indri the main canal continues navigable as far as Delhi. Between Indri and Munak, where the Hansi Branch strikes westwards to irrigate Jind and Hissar, several subsidiary channels are given off. The Nardak Distributary constructed in 1897-98 takes out of the main line at Uchana and gives much needed irrigation in the Nardak tracts of Karnal and Kaithal. The Budha Khera and Karnal Distributaries ir rigate land in the vicinity of Karnal town. The Bazida Distributary taking out at Gogripur serves the centre of the Karnal Pargana and extends to the northern villages of Panipat. The Goli Distributary taking out above the regulator at Munak irrigates a few villages in the south-west corner of the tahsil. At Munak water is again headed up to give a sufficient supply for the Hansi Branch, and here again percolation has caused some damage.

The old Delhi and Rohtak Branches have been completely abandoned except where their course happens to coincide with a new *rajbaha.* At present the main supplies of canal water for the Panipat tahsil are drawn from the Delhi Branch and the Hansi Branch, which bifurcate at Munak on the borders of the Karnal tahsil. The Delhi Branch, through its main distributaries, the Madlauda, Gohana and Asrana Rajbahas, irrigates the greater part of the Bangar circle. The Joshi minor and Butana Rajbaha of the Hansi Branch serve the villages on the Jind and Rohtak border. The Kabri Branch, taking out of the main canal near Karnal, is brought over the Panipat border and irrigates the extreme north-east of the Bangar circle and the town of Panipat. The small area of canal irrigation in the Khadir circle is supplied by this *rajbaha.*

The distributaries of the Delhi Branch are the most satisfactory in their working. They are controlled from Binjhol,

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the head-quarters of the Panipat canal sub-division. The Panipat villages at the tail of the Joshi and Kabri Distributaries, which are in the charge of the Karnal canal sub-division, are loud in their complaints. These distributaries have never worked satisfactorily. The Butana Rajbaha of the Hansi Branch managed from Rohtak gives ample supplies.

The Sirsa Branch opened in 1890 takes out at Indri and strikes due west. No irrigation is done from the main line in the Karnal tahsil. But the Habri Rajbaha, which takes off at Badhera, irrigates a few villages in the Indri Nardak.

The most important factor in the development of the Nardak and Bangar circles is, of course, the opening of the Sirsa Branch which runs from north-east to south-west parallel to and about four miles to the south of the Kaithal-Thanesar road. Two main distributaries, the Sidkan and the Habri Rajbahas, irrigate the country between the Sirsa Canal and the drainage line of the Chautang which was formerly the boundary of the territory belonging to the Bhai of Kaithal. The villages lying to the south-east of the drainage line were without irrigation until the opening of the Nardak Rajbaha in 1898. All these *rajbahas* have been aligned on the most approved principles, and when clear of silt their command of the irrigation area is almost perfect.

The Sirsa Branch irrigation is controlled by the Sub-Divisional Officer at Mundri. The Nardak Rajbaha is under the immediate charge of the Sub-Divisional Officer at Karnal. As at settlement the southern villages of the tahsil bordering on Jind are irrigated from the Mowana Rajbaha of the Hansi Branch which gives excellent supplies.

## HILL STREAMS.

The Rakshi.

The Rakshi has a course of little more than 10 miles from the point where it enters the Thanesar tahsil on the east to the town of Ladwa where it joins the original stream of the Chautang. Except to a few of the upper villages its floods are not very important and below Ladwa the channel is deep enough to carry off the water without inundating the surrounding fields. The Kurukshetr cut from the Rakshi to the sacred tanks of Thanesar still exists, but the channel is not kept properly cleared and its floods do harm as often as good.

The Western Jumna Canal.

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The Chautang.

The Chautang has altered its course a good deal since settlement. Shortly after entering the Thanesar tahsil and about three miles from the boundary the original channel has silted up and although one or two subsidiary channels are available the bulk of the water follows a series of depressions on the left bank of the old stream in a course roughly parallel to it until it enters a large lake about three miles north of Ladwa. From here the overflow escapes down the Ladwa-Shahabad road and so into the Rakshi and its original bed at Ladwa. Some of the flood water rejoins the original stream and is partly diverted into the Sarusti by the Sultanpur cut and partly flows down the old bed to its junction with the Rakshi at Ladwa. Near the border of Ambala a few villages benefit by the silt which the Chautang carries in its upper reaches. Below the point where the old channel has silted up, the villages almost without exception have suffered from the diversion of the water into the fields. In many places the present course of the stream is marked by no defined bed and what were formerly rice fields have become mere *jhils* or, owing to overflooding and denudation of the surface soil, are now unfit for cultivation. A scheme for clearing the old bed and restoring the stream to its original channel has been taken up.

The Rakshi Chautang Canal.

The Rakshi and Chautang Canal enters the Karnal tahsil in the north of the Bangar between Indri and the Grand Trunk Road. The Sirsa Branch cuts across the course of both these streams which are syphoned under its bed. Up to 1897-98 the flood water brought across the line of the Sirsa Branch was allowed to inundate the country to the west of the Grand Trunk Road. But since that year, partly by straightening the original drainage channels, and partly by digging new water-courses, the floods have been much reduced. On the whole these works have been advantageous. The system, half drainage and half canal, is supplemented to a certain extent from the Sirsa Branch. Enough water is given for rice sowing in a year of average rainfall, but for the spring harvest only one watering can be supplied. The original streams still continue their course through the Nardak, taking the surplus from the Chautang Canal system and surface drainage. A few large villages in the west of the Karnal tahsil are still dependent on the floods of these natural channels.

The Sarusti.

The Sarusti above Singhaur has no defined bed. But in its lower reaches, where it can overflow its banks, it becomes

useful to the rice lands of certain villages. Its floods, however, rarely extend to any distance, it carries no silt, and its banks are usually high and steep. Near Thanesar they are sufficiently low to enable certain villages to obtain some benefit by the erection of "bands"; these have recently been prohibited in the interests of the Sarusti Canal, the supply of which depends upon the water collected in a large lake, called the Sainsa Jhil, in the neighbourhood of Pehowa.

The Sarusti.

The Markanda is distinguished from the rest of the hill streams by its extensive flooding and by the heavy deposits of silt which it leaves in the more favoured villages. Sand is more rarely deposited and as a rule only in the vicinity of the banks. If we are to judge by the experience of the expiring settlement, its natural vagaries have been somewhat overestimated in the past. It is true that in some places the bed of the river is on the ridge of the country and the conditions which make for sudden changes are therefore always present. The question of controlling its waters is mainly an engineering one and is complicated by considerations of the supply of water for the Sarusti Canal. The construction of the road and the railway bridges which span the river within two hundred yards of each other at Shahabad and the training works which run for several miles east and north of that town confine the stream to a definite bed for the first few miles of its course through the tahsil: they have also given it a sharper current for some distance below these works and this has operated to keep it in its existing bed: the Kalsana channel has been closed and the full stream now sets strongly on Kalsana, three miles below the bridges. Some four miles below Kalsana a branch strikes south along the western border of Arjana Khurd, and it was expected at last settlement that this would shortly become the main channel. These expectations were not realised, though the branch still carries a considerable supply of water in the rains. It is quite a subordinate stream and its floods do not spread beyond the borders of the few villages through which it passes where it empties itself into the Sainsa Jhil. East of this branch there are marked indications of the formation of a new channel running south of Arjana Khurd and thence towards Lukhi. The main stream up to 1906 continued in its old channel, joining the Sarusti in the Sainsa Jhil. It will thus be seen that throughout its whole course the Markanda up to 1906 occupied nearly the same position as it did at last settlement. In 1905, however, it shewed signs of an intention to break away along an old depression from Kanthala towards the Umla in the Kaithal tahsil.

The Markanda.

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The Umla.

The Umla has a course of only about eight miles through the north-western corner of the tahsil, but its floods enter the district from Ambala much higher up at Khokar Mazra. Below this point they combine with the water of the stream which is called at different points in its course the Dhara, Gadla, or Jhoda Nala, and several villages in the direct line of the inundation now suffer from overflooding; even in the winter rains the waters often spread to an extent sufficient to drown the less hardy spring crops. Autumn crops can only be sown with any prospect of success in the higher ground, at least in years of normal or excessive rainfall. The same conditions however may be said to prevail in all villages of these parts which are exposed to the direct action of the Markanda and Umla floods, and they render the question of assessment one of no ordinary difficulty. Further west the Umla runs under the large and populous villages of Thol and Ismailabad, but it floods to any extent only on its left bank, where its sphere of influence is almost conterminous with that of Markanda. The latter stream carries much more silt than the Umla and its floods are consequently held in higher estimation. It is certainly a fact that the Markanda villages are generally more prosperous and the soil is better than in those served by the waters of the Umla.

Sainsa Jhil.

The Umla and Markanda, as they issue from the Thanesar tahsil, affect some villages in the eastern corner of the Naili circle lying north and east of the Thanesar-Pehowa road and its continuation towards Guhla. The Umla eventually joins the Ghaggar and Nardak, while the bulk of the Markanda water finds its way into th Sainsa Jhil where it joins the Sarusti. Roughly speaking the road from Ambala to Pehowa may be said to separate the Umla flooded area on the west from that of the Markanda on the east. But the boundary is constantly overstepped. The action of both streams at this point in their course is identical. Both are depositing silt and improving the villages which they affect. During the four years of settlement, the Markanda has laid down rich deposits in the large village of Bhorak, and is slowly improving a few small estates near Pehowa. But the principal change has been wrought in the villages bordering on the Sainsa Jhil. The Markanda entering the *jhil* from Bibipur deposits all its remaining silt in the low-lying land of the surrounding villages. At the end of the flood season the water of the *jhil* is drawn off by the Sarusti Canal, leaving stretches of admirable soil on which the finest crops of gram and wheat can be raised.

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The natural drainage channel fed by the floods round Pehowa is known as the Sarusti Nadi, though the waters it carries are mainly those of the Markanda. A large tract, known as the Sarusti Naili, depends for its prosperity on the proper management of these floods. It is unnecessary to enter here into the details of the arrangements for the distribution of the water in the *nadi*. They are described in full in paragraph 30 of the Kaithal-Gula Assessment Reports.

The Sarusti Nadi below the Sainsa Jhil.

From the Sainsa Jhil issues the artificial work known as the Sarusti Canal, designed primarily to drain the *jhil* and incidentally to irrigate the higher lands to the south of the Sarusti Nadi. A main outlet has been dug on the south side of the *jhil* and the flood water coming down this outlet is regulated by a sluice constructed on a bridge crossing the Pehowa-Thanesar road. A few miles further down, the Kaithal Branch strikes off southwards and irrigates the high land between the Sirsa Branch of the Western Jumna Canal and the Sarusti Nadi. The main canal continues to run along the Bangar bank just above the Sarusti valley and two *rajbahas* (No. 1 and the tail of Guhana Rajbaha) irrigate the village immediately south of the main line. Rajbaha No. 2 irrigates two villages to the west of the main line.

The Sarusti Canal.

The main canal was opened in 1896, the Kaithal Branch in 1899, the Guhana Rajbaha in 1902 and the Kaithal minor in 1906. A *rajbaha* (No. 3) taking out at Nawach and commanding about 1,000 acres between Nawach and Kaithal is under consideration.

The canal has achieved a large measure of success. In the rainy season Pehowa is still at times inaccessible, but the floods are carried off by the end of September and the climate is gradually improving.

Ghaggar

The main branch of the Ghaggar, known as Untsarwali Nadi, passes to the east of the cluster of the Karnal villages lying east of Arnauli, and is joined near Bengala by another channel known as the Gadea and by what remains of the Umla floods. The stream has here excavated a channel about 40 feet deep, and flows westwards till the mouth of the Puran is reached at Dhandauta. In high floods some water passes down the Puran, but the main body of water, augmented by the Patiala Nadi at Ratta Khera Lukman, flows on south-west, till it leaves the Karnal district at Urlana. The Puran from Dhandauta to Bubakpur was the original bed of the Ghaggar.

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Ghaggar.

At Bubakpur it took a turn and passing through Lalpur and Bhattian followed the course of the present main stream. A *land* was erected at Bubakpur to force the water down towards Agaundh, and this Agaundh Branch is now regarded by the people as the Puran Nadi. The Puran has silted up throughout its length, and every year a deposit of sand about 15 feet high is piled at its mouth. The channel was cleared at last settlement and again in 1906. But the result is unsatisfactory. It is of course out of the question to place an ordinary regulator in the Ghaggar. The cost would be prohibitive, even if no objection were made by the Patiala and Bikaner States or by the Canal Department. But it should not be impossible to raise the floods by a stop-dam in the bed of the channel, and regulate their flow by a gate at the mouth of the Puran.

Wells.

The volume of water which enters the district by river, flood, or canal provides a natural sub-surface reservoir which is of the utmost importance to agriculture. Except in the Nardak and the Kaithal Bangar south of the Sirsa Branch the water level is nowhere lower than 25 feet below the surface of the ground. Wells are therefore not difficult or expensive to sink except where the changes in the alignment of the canal have disturbed the sub-surface water table. The Khadir tracts are naturally the most favoured. Water is found at 15 feet and the cost of a masonry well is not more than Rs. 300. In the Bangar of Thanesar, Karnal, and in the similar tracts of the Kaithal tahsil, known as the Pehowa Bangar and the Andarwar, the water level is lower and the cost proportionately higher. The Chachra of Thanesar, the Naili and the Powadh villages beyond the Ghaggar are not less favoured.

*Sailab.*

The effect of the Jumna floods has been already described as harmful in the *kharif*, though beneficial in the *rabi* harvest. The value of *sailab* land on the banks of the Jumna is little higher than that of ordinary *barani* land in the Khadir.

Canal *sailab.*

Between Radaur in the Thanesar tahsil and Indri the land on either bank of the canal suffers from percolation to a greater or less extent. On the right bank matters have been improved by a system of silting reaches which have raised the level of the ground and made cultivation again possible. The villages which have received most benefit from these operations lie in the Thanesar tahsil. Those on the left bank in the Karnal tahsil have suffered to a much greater extent, and in spite of an extensive system of drainages it has

Canal *sailab.*

been necessary to undertake the large embankments and silting reaches now in course of construction. The state of things is due to the water held up at the Indri regulator to supply the Sirsa Branch which leaves the main canal at this point. But beyond this belt of water-logged soil the effect of percolation is beneficial to crops. The moist area extends further east than in 1886, but since the opening of Sirsa Branch in 1891 has given rise to excessive water-logging, it is doubtful whether the land is as valuable as it was at last settlement. In 1886 the old canal to the south of Indri had just begun to be used as an escape. The land of some villages on its banks was entered at settlement as *sailab*. But these villages have become much drier since settlement and the area of canal *sailab* has been restricted in this direction. Between Indri and Munak the main canal affects a strip of land of varying width along its banks, especially near Munak. The result is on the whole beneficial to the villages in that part of the district with the exception of Munak itself.

Markanda and Umla *sailab.*

The silt deposited by the Markanda is generally of the highest quality, and is the chief factor in the prosperity of the tract known as the Markanda Bet. The silt of the Umla is less beneficial, but in the upper course of that stream the alluvial soil is fertile enough.

The action of the Markanda and Umla in the lower part of their course is somewhat as follows. The floods turn aside from villages which they have raised in past years by deposits of silt to others on a lower level. The first layers of silt are deposited in depressions, where the soil is usually a hard clay covered with dense masses of *panni* and *dab* grass. In a year of good floods six inches or more of the most excellent soil have been superimposed on the original clay bed. Next year the process is repeated, and at the end of three or four years the old depression contains about two feet of the best possible loam. As the floods subside the people sow wheat in the cracks of the soil, securing very fair crops with little expenditure of trouble. With each succeeding flood the silt deposited becomes lighter and more sandy. The land is then regularly ploughed and gram is usually substituted for wheat. If the floods continue to affect the village the soil becomes the good *seoti* of the Bet Markanda. But before this stage is reached the water is often diverted in another direction owing to the rise in levels created by the floods themselves.

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Sargusti and Ghaggar *sailab*]

Below Pehowa a large area is flooded yearly from the Sarusti Nadi either by spill from the main channel or by artificial cuts. The soil is very stiff, but well flooded produces excellent crops of rice and gram.

## Section B. History.

Archæology.

The district undoubtedly contains archæological remains of the highest interest. Unfortunately they lie buried under towns and villages where investigation is difficult and liable to misinterpretation. The environs of Thanesar and Pehowa, and the Polar mound on the Sarusti, the town of Kaithal, the lofty eminence of Amin, and numerous villages in the Nardak would, if explored, fill up many blanks in early Hindu history.

Villages on the edge of the Bangar tract, raised high above the surrounding plain, such as Indri, Churni and Kohand, mark the position of old forts guarding the fords of the Jumna when its course lay further to the west than at present. But the antiquities to be met with are few in number. A detailed account of the more important will be found in the Report of the Punjab Circle of the Archæological Survey of 1888–89 (published in 1891). The chief objects of antiquarian interest are briefly described in Chapter IV of this volume under the sections dealing with the place where each is situated.

One most curious relic deserves separate mention, the old shrine of Sita Mai at the village of that name in the Nardak. It is built in the ordinary form of a Hindu temple. It is of brick; but the curious feature is the elaborate ornamentation which covers the whole shrine, the pattern of which is formed by deep lines in the individual bricks, which seem to have been made before the bricks were burnt, so that the forms they were to take must have been separately fixed for each brick. A large part of the shrine was pulled down and thrown into the tank by some iconoclast Emperor; and though the bricks have been got out and the shrine rebuilt with them yet they have been put together without any regard to the original pattern. The broken finial, part of which has been recovered, is of a curious shape, if it was originally made for a Hindu temple, as it is more suggestive of Buddhist symbolism. The shrine is said to mark the spot where the earth swallowed up Sita in answer to her appeal for a proof of her purity.

Two inscriptions dating from the end of the ninth century A. D. found at Pehowa show that it was included in the dominions of Mahendrapala, king of Kanauj, at that period. The